

CLAIMS:

1. An apparatus for replacing at least a portion of an intervertebral disc in a spinal column, comprising:

a first member having a first vertebral contact surface for engagement with an endplate of a first vertebral bone in the spinal column, and having a first articulation surface; and

a second member having a second vertebral contact surface for engagement with an endplate of a second vertebral bone in the spinal column, and having a second articulation surface, wherein:

an intervertebral disc space is defined substantially between the first and second endplates of the first and second vertebral bones, and

at least one of the first and second articulation surfaces is a saddle shaped surface, and the articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension, and lateral bending.

2. The apparatus of claim 1, wherein both the first and second articulation surfaces are saddle shaped.

3. The apparatus of claim 1, wherein the first articulation surface is saddle shaped and the second articulation surface is defined by at least one bearing surface for engaging respective portions of the first articulation surface when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension, and lateral bending.

4. The apparatus of claim 1, wherein the at least one saddle shaped articulation surface is defined by at least one bearing surface that in the aggregate cooperates to engage respective portions of the other articulation surface when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension, and lateral bending.

5. The apparatus of claim 4, wherein the at least one bearing surface defines a contiguous saddle shaped articulation surface.

6. The apparatus of claim 1, wherein the at least one saddle shaped articulation surface is one of:

defined at least by a concave arc having a radius of curvature A about a first axis substantially perpendicular to an anterior-posterior plane of the spinal column, and a convex arc having a radius of curvature B about a first axis substantially perpendicular to a lateral plane of the spinal column; and

defined at least by a convex arc having a radius of curvature C about a second axis substantially perpendicular to the anterior-posterior plane of the spinal column, and a concave arc having a radius of curvature D about a second axis substantially perpendicular to the lateral plane of the spinal column.

7. The apparatus of claim 1, wherein the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to at least axially rotate relative to one another through a range of angles.

8. The apparatus of claim 1, wherein the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to axially rotate relative to one another through a range of angles without substantially displacing the first and second vertebral bones away from one another.

9. The apparatus of claim 8, wherein the first and second articulation surfaces are sized and shaped such that the first and second vertebral bones are substantially displaced away from one another at axial rotations outside the range of angles.

10. An apparatus for replacing at least a portion of an intervertebral disc in a spinal column, comprising:

a first member having a first vertebral contact surface for engagement with an endplate of a first vertebral bone in the spinal column, and having a first articulation surface; and

a second member having a second vertebral contact surface for engagement with an endplate of a second vertebral bone in the spinal column, and having a second articulation surface, wherein:

an intervertebral disc space is defined substantially between the first and second endplates of the first and second vertebral bones, and

at least one of the first and second articulation surfaces is defined by at least one bearing surface that in the aggregate cooperates to define a saddle shaped surface, and the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension, and lateral bending.

11. The apparatus of claim 10, wherein each of the first and second articulation surfaces include at least one bearing surface that in the aggregate defines a saddle shape.

12. The apparatus of claim 10, wherein the first articulation surface includes at least one bearing surface defining the saddle shape and the second articulation surface is defined by at least one bearing surface for engaging respective portions of the first articulation surface when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension, and lateral bending

13. The apparatus of claim 10, wherein the at least one bearing surface defines a contiguous saddle shaped articulation surface.

14. The apparatus of claim 10, wherein the at least one saddle shaped articulation surface is one of:

defined at least by a concave arc having a radius of curvature A about a first axis substantially perpendicular to an anterior-posterior plane of the spinal column, and by a convex arc having a radius of curvature B about a first axis substantially perpendicular to a lateral plane of the spinal column; and

defined at least by a convex arc having a radius of curvature C about a second axis substantially perpendicular to the anterior-posterior plane of the spinal column, and by a concave arc having a radius of curvature D about a second axis substantially perpendicular to the lateral plane of the spinal column.

15. The apparatus of claim 10, wherein the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to at least axially rotate relative to one another through a range of angles.

16. The apparatus of claim 10, wherein the first and second articulation surfaces are sized and shaped to engage one another when the first and second members are disposed in the intervertebral disc space to enable the first and second vertebral bones to axially rotate relative to one another through a range of angles without substantially displacing the first and second vertebral bones away from one another.

17. The apparatus of claim 16, wherein the first and second articulation surfaces are sized and shaped such that the first and second vertebral bones are displaced away from one another at axial rotations outside the range of angles.